UPDATE FOR SCALLOP FISHERY AREA/TIME CLOSURE TO REDUCE YELLOWTAIL FLOUNDER BY-CATCH ON GEORGES BANK IN 2010

Context

An area of Georges Bank approximately 100 nautical miles^2 was closed to the offshore scallop fishery during June 2009 to reduce yellowtail flounder by-catch. The closure area was determined following a review of yellowtail flounder distribution, particularly at spawning time via observed groundfish trips from the otter trawl fleet (2005 – 2008) and observed scallop fishing trips on Georges Bank (2001-2008, except 2003). Temporal trends in the distribution of the offshore scallop fishery between 1997 and 2008 were also considered.

This report provides an update to the 2009 report on the scallop fishery area/time closure to reduce yellowtail flounder by-catch on Georges Bank. This report considers the 2009 observed by-catch data from both the groundfish and scallop fishery and the distribution of the scallop fishery in 2009. Data from 2009 was used to ascertain possible trends in yellowtail flounder distribution, especially during the second quarter (April to June) when yellowtail flounder is known to spawn (O'Brien et al., 1993).

Response

By-catch in the Groundfish Fishery

While observer coverage of the otter trawl fishery extends back to earlier years, the time series of by-catch rates used to examine the spatial distribution of yellowtail flounder starts in 2005. Threshold values of by-catch rates have been steadily rising since 2005, and a 10 kg/hour rate was considered appropriate to use since 2007 compared to a 5 kg/hour rate used for 2005–2006. The adult yellowtail flounder biomass increased to the highest adult biomass since 1973 (20,600 mt or 28,000 mt, depending on model formulation), at the beginning of 2009 (TRAC, 2009).

In 2009, observer coverage for the groundfish otter trawl fleet decreased from 2,019 sets in 2008 to 1,125 sets in 2009 (Table 1). Of the 1,125 sets observed in 2009, 79% caught no yellowtail flounder compared to 69% in 2008, 76% in 2007, 78% in 2006 and 85% in 2005. As in previous years, by-catch rates were standardized to catch per hour (kg/hour). It is possible to compare sets across month and cells (5 x 3.33 nautical miles) since set locations are provided. Observed sets occurred in all months except March, April and May 2009, months in which there is no groundfish fishery on Georges Bank (Table 1). However, in 5Zm, observer coverage was available for June and July only as most of the groundfish fishery is prosecuted in 5Zj. The majority (99%) of the observed sets were from 5Zj. The months where yellowtail flounder was present in the observed sets are January, June, July, August, September and November.

The highest average catch rate occurred in June for both 5Zj and 5Zm for 2009 (2.30 and 18.55 kg/hour, respectively). No yellowtail flounder was observed caught in July in 5Zm but only one set was observed (Table 1). Average catch rates in 5Zj were low in January, peaked

in June, dropped quickly in July and remained low for the rest of the year (Figure 1). The monthly average catch rates in 5Zj in 2009 were lower than 2007 and 2008 (4.01, 7.83, 2.30 kg/hour for 2007, 2008 and 2009, respectively). For 5Zm, 2009 monthly average catch rates were higher than 2007, and almost three times that of 2008 (15.07, 6.83, 18.55 kg/hour for 2007, 2008 and 2009, respectiveiy).

The 2009 maximum catch rates (Table 1) have significantly declined from 2008 (117.87 kg/hour for 5Zj, and 122.31 kg/hour for 5Zm, in 2008). In 2009, the maximum catch rate occurred in June for both areas. The maximum catch rates in 2005 and 2006 occurred in June, for 2007 they occurred in July, and in 2008 they occurred in July for 5Zj and June for 5Zm.

In 2009, the spatial coverage of the otter trawls sets was mainly limited to the northern part of 5Zj except for June and July. June was the only month that had cells with catch rates equal to or greater than 5 kg/hour, ranging from 5.08-18.39 kg/hour (Figure 2). Observed otter trawl sets for June 2005 to 2009 covered all of 5Zj, while coverage was limited to the western portion of 5Zm (Figure 3).

In Figure 3, cells are shaded according to by-catch rates. Nine cells, labeled in descending order, on the Canadian portion of Georges Bank have an average by-catch rate greater than 10 kg/hour. These range from 165.44 to 10.50 kg/hour. A cluster of 5 cells in 5Zm is in the vicinity of the Yellowtail Hole. The high catch rate cells in 5Zj are less aggregated, two cells together and two by themselves. The by-catch rate of cell 1 is relatively high (165.44 kg/hour) compared to other cells. This estimate is driven by observations in June 2006 (320 kg/hour). The by-catch rate of cell 9, adjacent to cell 1, is significantly lower at 10.50 kg/hour. By-catch rates for cells 2 to 8 range from 26.67 to 12.61 kg/hour during the period considered.

By-catch in the Offshore Scallop Fishery

Throughout 2009, 1 to 2 fishing trips per month were observed in the offshore scallop fleet. There was slightly more coverage of 5Zm in 2009 than in 2008 (Figure 4). In 2009, there were no cells with a by-catch rate greater than 5 kg/dredge. The only occurrences of cells with a by-catch rate over 2.5 kg/dredge were in March, May and October; two cells in each month (Figure 4). The 2009 monthly by-catch data was combined with the data from 2001 to 2008, except 2003, in Figure 5. There were 2 cells with catch rates greater than 25 kg/dredge in April, and 1 cell in August in the same location as one of the April cells (Figure 5).

Estimated annual discards of yellowtail flounder in the scallop fishery declined in 2009 to the lowest in the observed series. In 2005, 246 t were discarded, in 2006 discards increased to 504 t then declined in 2007 to 94 t, increased in 2008 to 117 t (Gavaris et al., 2009) and then declined in 2009 to 84 t.

Monthly average by-catch rates from observed scallop trips from 2001 to 2009 are much less indicative of yellowtail flounder density distribution than otter trawl observed trips. This is due to less extensive coverage of the observed scallop trips and by-catch avoidance protocols put in place by the offshore scallop fleet.

Catches of the Offshore Scallop Fishery

Scallop catch data for 2009 was integrated with the past years' series where the catch data for the second quarter of the year was aggregated in 5 min longitude by 3.33 min latitude cells. Second quarter catches were 36% (2,067 tonnes of meats) of the total 2009 landings, with fishing activities highly concentrated in zone 5Zj (Figure 6).

Second quarter catch data from 1997 to 2009 inclusive are consistent with previously observed spatial patterns (Figure 7). Cells in the northern part of Georges Bank have higher catches than cells located in the southern part. Cells in Georges Bank 'a' also have higher catches than cells in Georges Bank 'b'. With the inclusion of the 2009 catch data, the cells with an average catch over 50 t are similar to 2008, with one cell being dropped and another being added. This shift is explained by the opening of an area previously closed and the implementation of a new voluntary closure area in 2009. There are 6 cells with 50 t per year or more, all located in 5Zj.

Conclusions

Yellowtail flounder by-catch trends between the groundfish otter trawl fishery and the observed trips in the scallop fishery can be compared for the last 5 years (2005-2009). By-catch rates have declined in 2009 in the otter trawl fishery. The highest average catch rate occurred in June for both 5Zj and 5Zm for 2009. In the 2009 scallop fishery, there were no cells with a yellowtail flounder by-catch rate greater than 5 kg/dredge as seen from at sea observer data.

Impacts of the June 2009 area/time closure are as follows: the cells closed in 2009 were in slightly different locations than in 2008; the five cells located in the vicinity of the Yellowtail Hole did not require closing as the offshore scallop fleet was not planning to fish this area in June (Figure 6); three cells were closed in 5Zj, and fishing activities were affected as these cells contained significant commercial scallop biomass.

Given the by-catch rates from the otter trawl fishery as an established proxy for yellowtail flounder density and distribution, 9 cells with rates greater than 10 kg/hour could qualify for an area/time closure for 2010. Eight of these cells are the same as in 2009, with the addition of one cell located in the northwest part of the bank, which is partially located in an area presently closed to protect juvenile scallops (Figure 8). The closure of the cluster of cells 2, 3, 4, 6, and 7 located in the vicinity of the Yellowtail Hole would have a minimal impact on scallop fishing activities (Figure 9). The majority of fishing activity takes place in 5Zj where cells 1, 5, 8, and 9 are located. These four cells are located in areas of important commercial scallop aggregations. Cell 8 is located in an area that has not been exploited recently since it is part of a current scallop seed closure area, but this voluntary closure could be opened in the near future.

Table 1: Number of observed otter trawl sets and maximum yellowtail flounder catch rates (kg/hour) by month in 2009 in unit areas 5Zj and 5Zm.

	Number of sets			Maximum catch rate (kg/hour)	
	Unit Area			Unit Area	
Month	5Zj	5Zm	Total	5Zj	5Zm
1	208		208	2.73	
2	48		48	0.00	
3					
4					
5					
6	307	10	317	56.36	49.28
7	122	1	123	5.04	0.00
8	153		153	1.40	
9	81		81	0.74	
10	100		100	0.00	
11	78		78	1.14	
12	17		17	0.00	
Total	1114	11	1125		

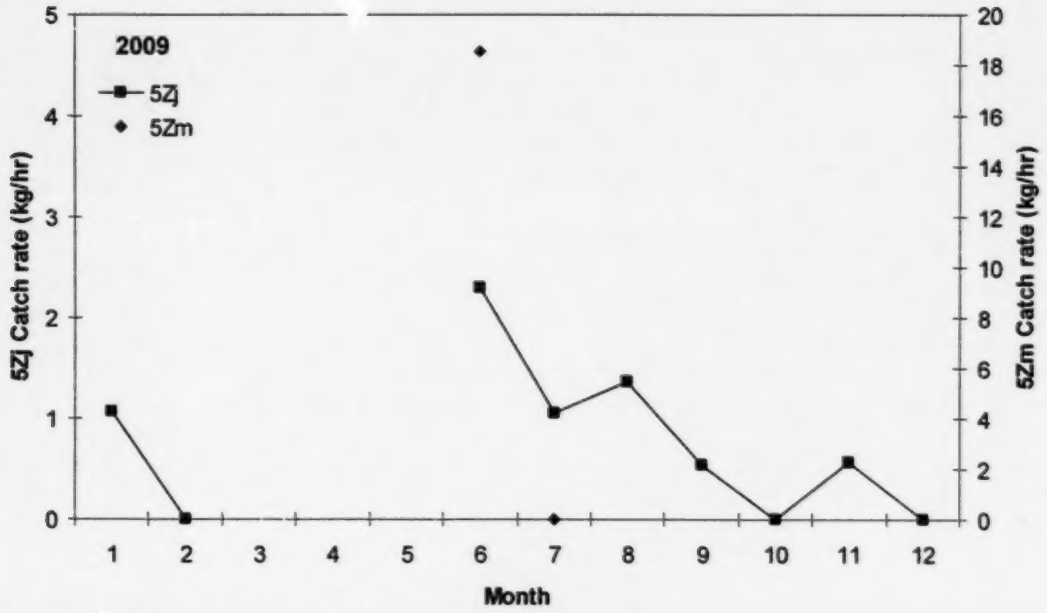

Figure 1: Average yellowtail flounder catch rates (kg/hour) by month and unit area for observed otter trawl sets in 2009. There was only one observed set in July 5Zm.

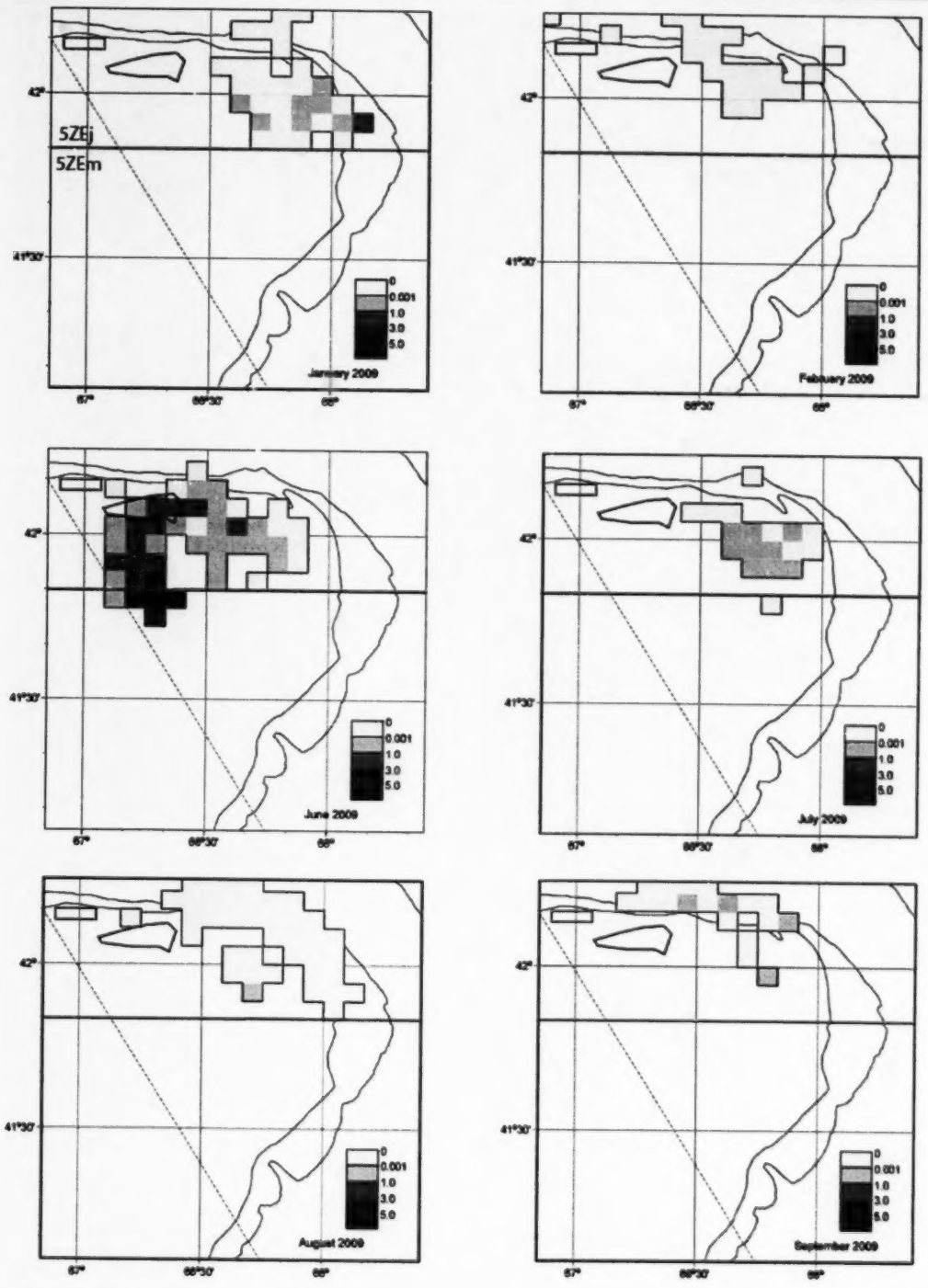

Figure 2. Average by-catch rates (kg/hour) for yellowtail flounder in 2009 for observed otter trawl sets on Georges Bank (there was no groundfish fishery in March, April, or May).

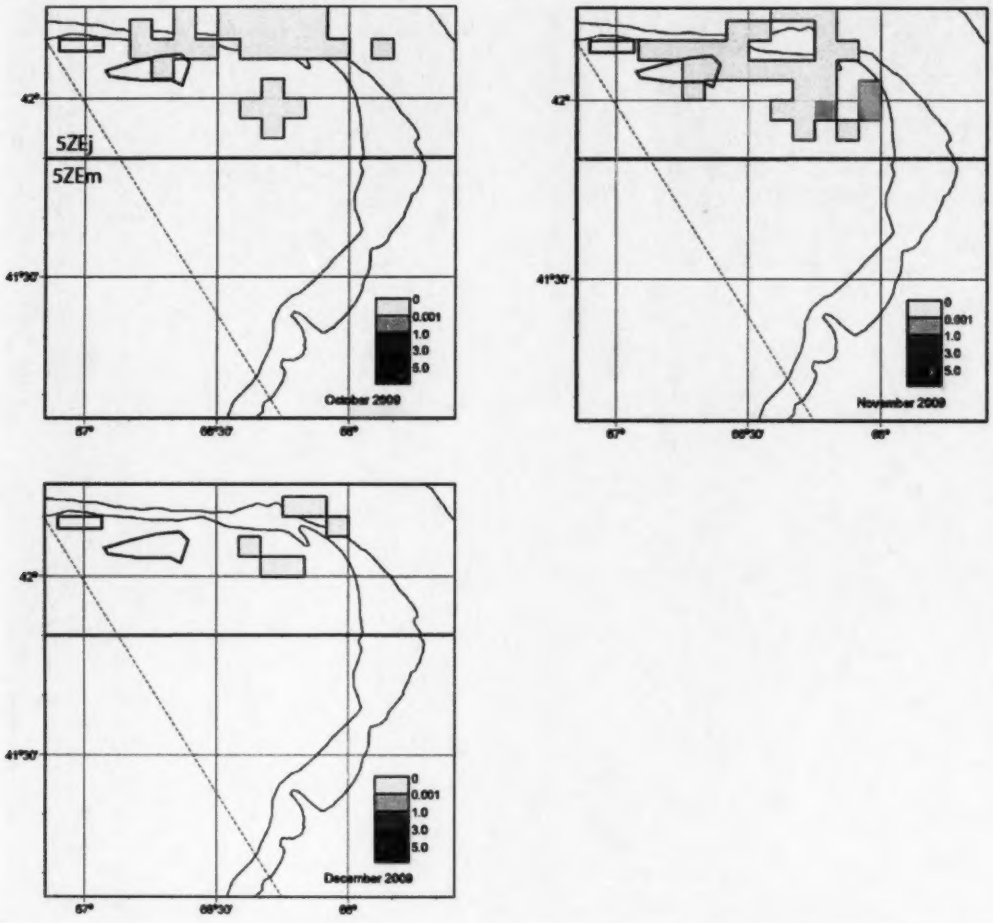

Figure 2 (continued). Average by-catch rates (kg/hour) for yellowtail flounder in 2009 for observed otter trawl sets on Georges Bank (there was no observed yellowtail flounder in March, April, or May).

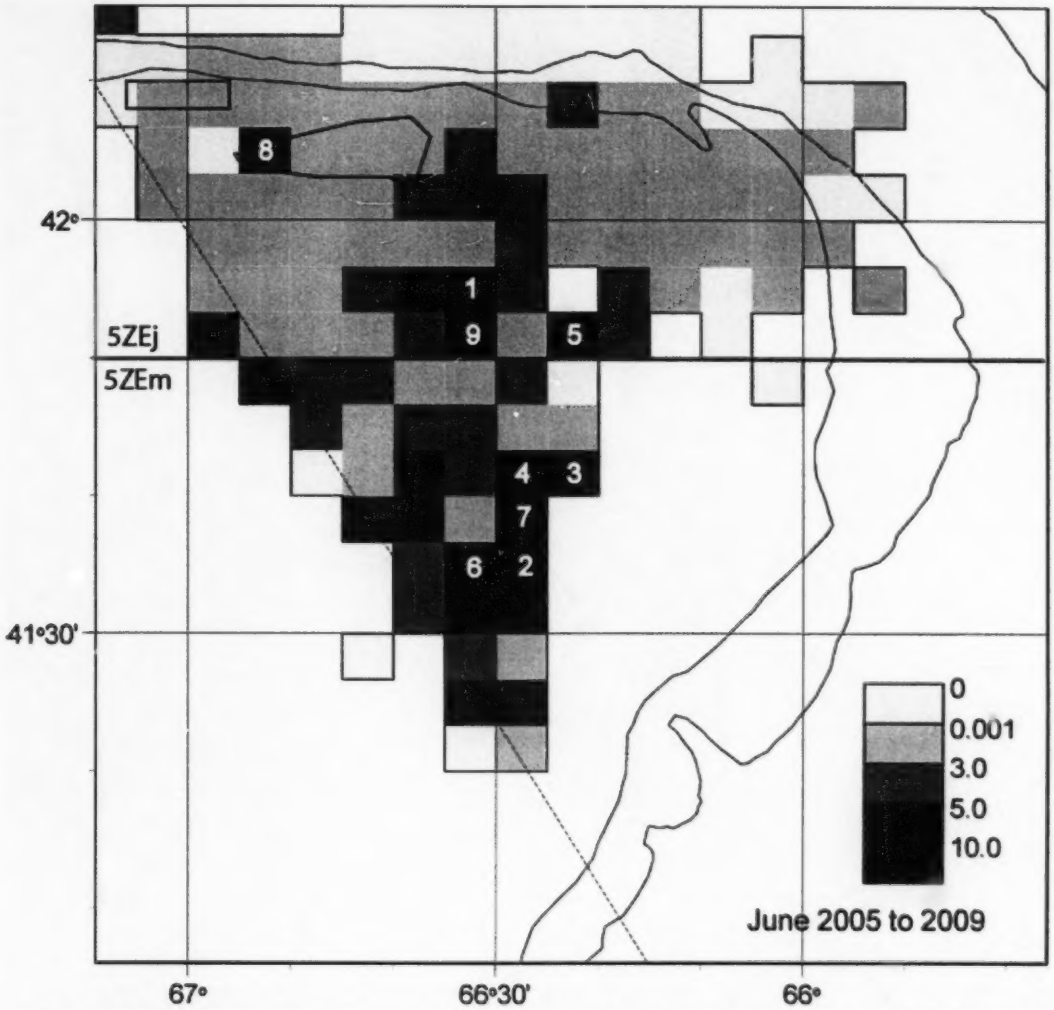

Figure 3. Average yellowtail flounder by-catch rates (kg/hour) for the month of June during 2005 to 2009 for observed otter trawl sets on Georges Bank. Cells located on the Canadian side with rates greater than 10 kg/hour are labeled in descending order.

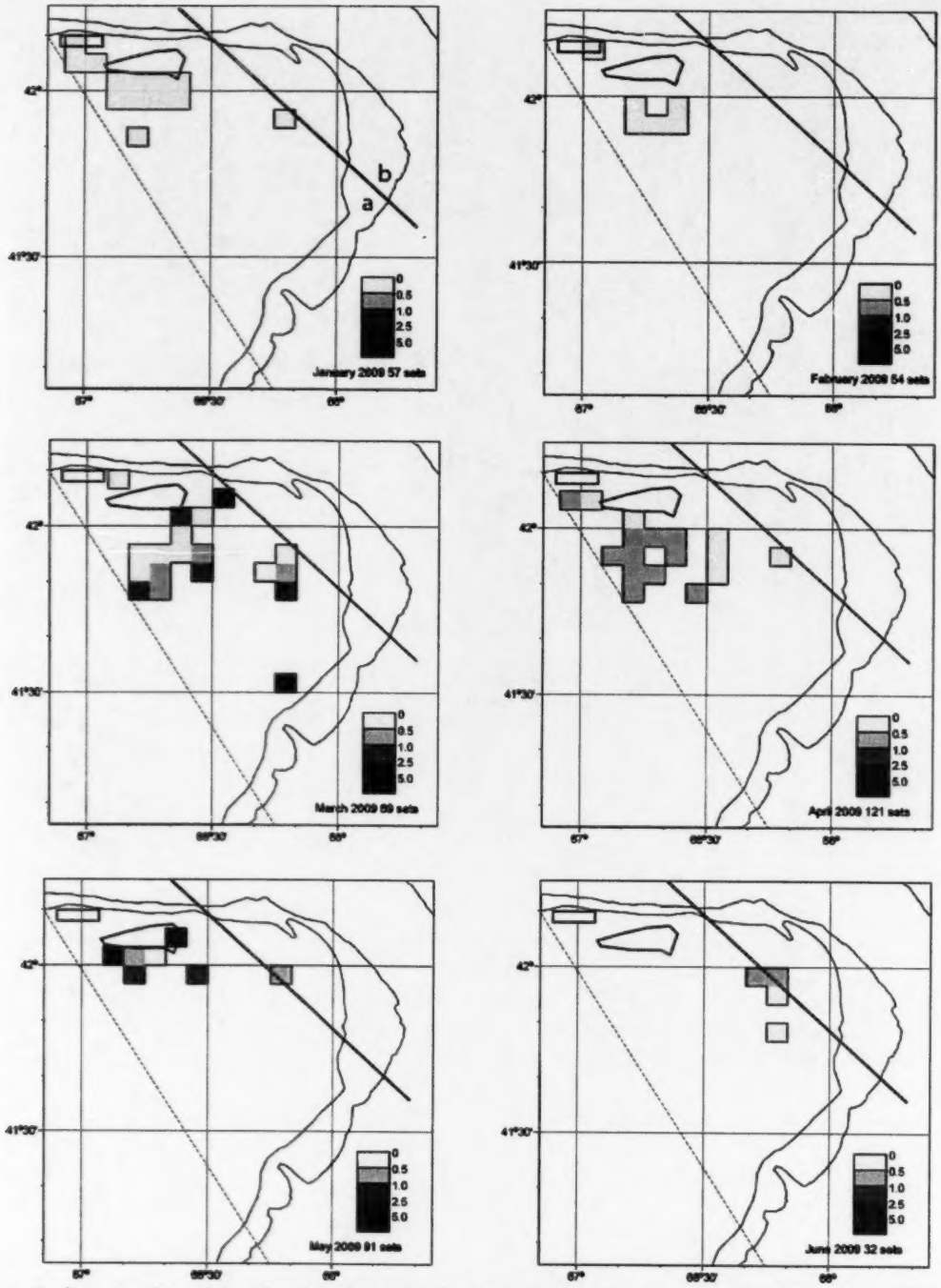

Figure 4. Average by-catch rates (kg/dredge) of yellowtail flounder on a monthly basis in 2009 from observed scallop trips on Georges Bank. The areas outlined in red are the voluntary scallop seed closure areas that are currently in place.

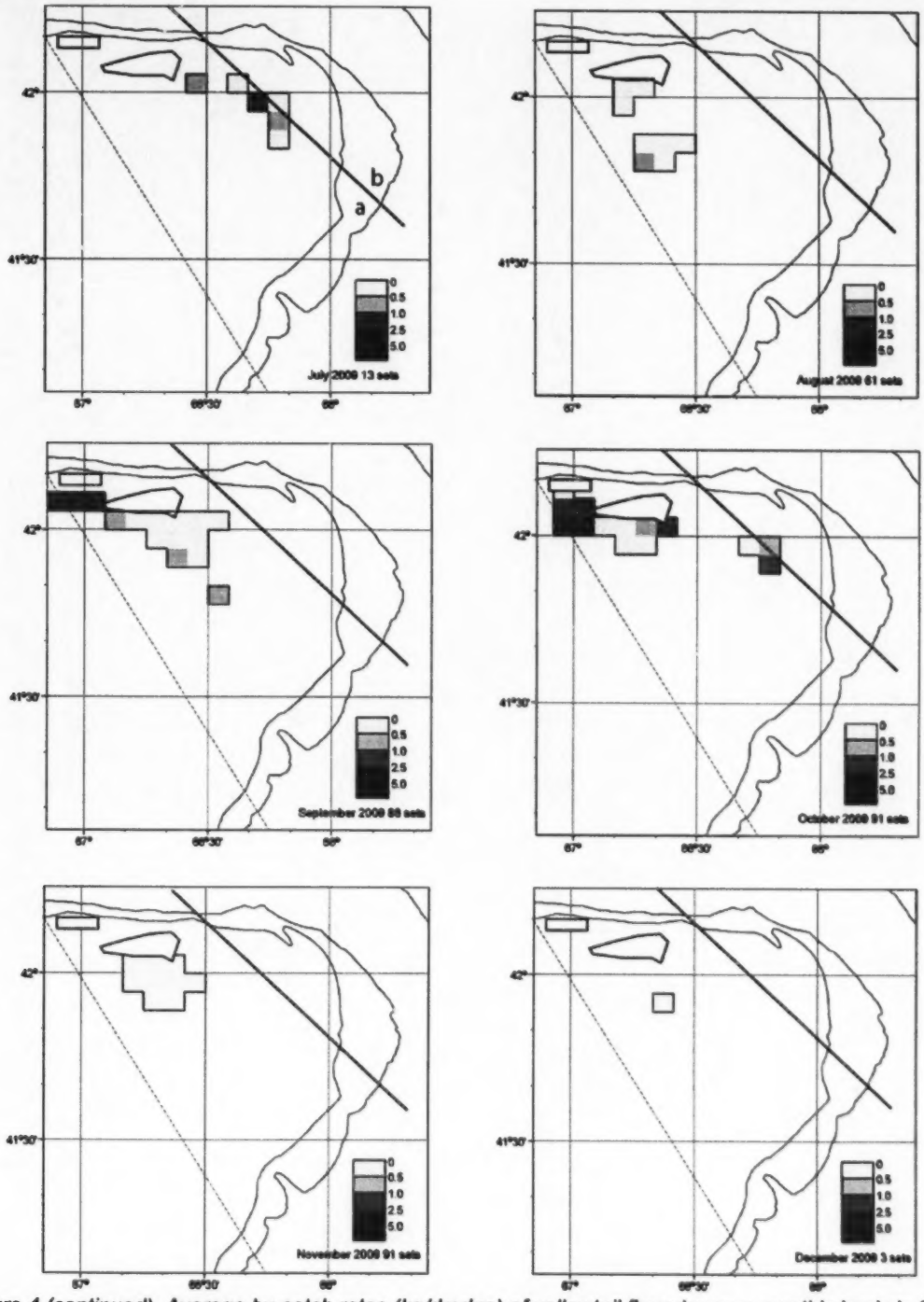

Figure 4 (continued). Average by-catch rates (kg/dredge) of yellowtail flounder on a monthly basis in 2009 from observed scallop trips on Georges Bank. The areas outlined in red are the voluntary scallop seed closure areas that are currently in place.

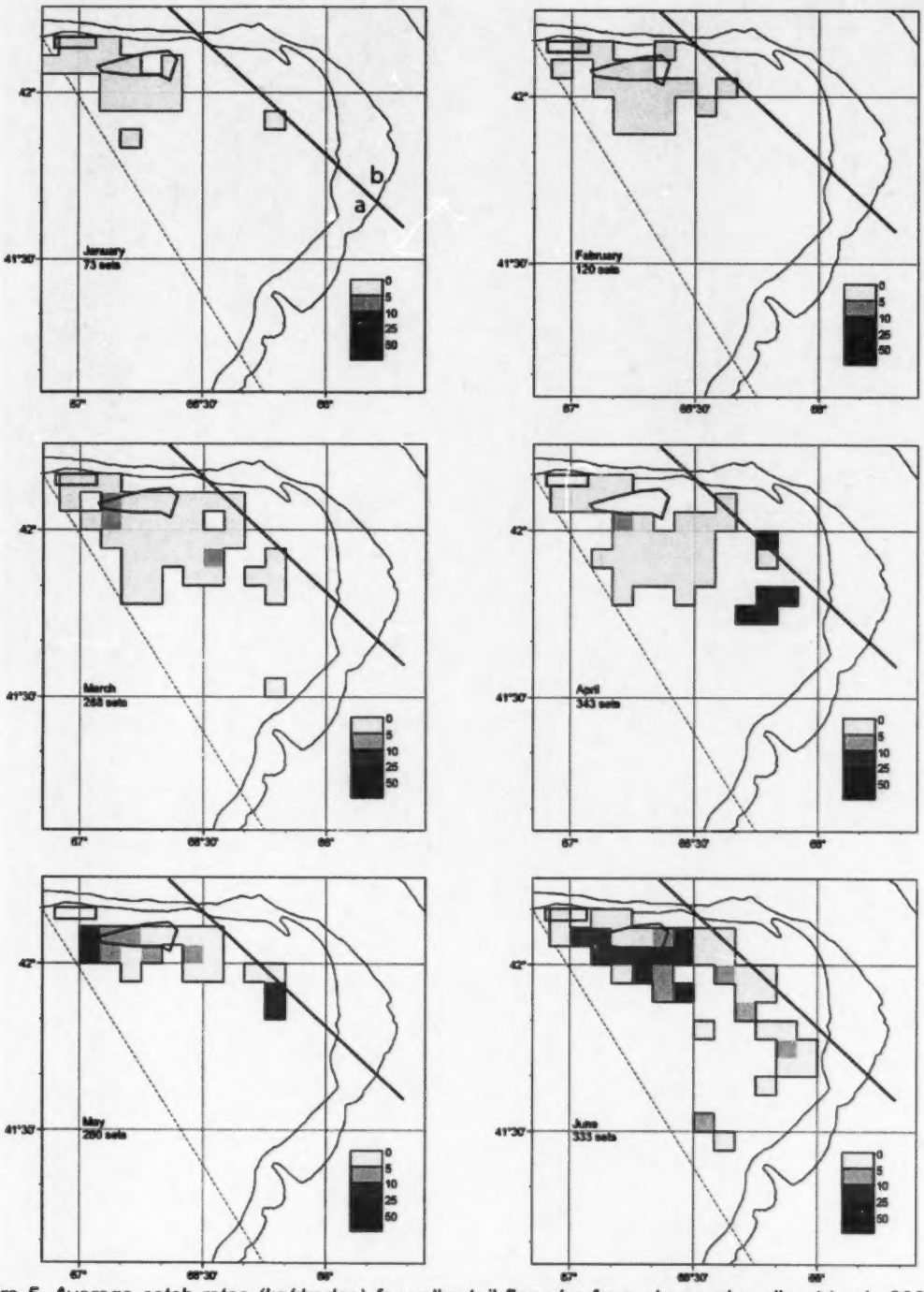

Figure 5. Average catch rates (kg/dredge) for yellowtail flounder from observed scallop trips in 2001 to 2009 (except 2003) on Georges Bank. The areas outlined in red are the voluntary scallop seed closure areas that are currently in place.

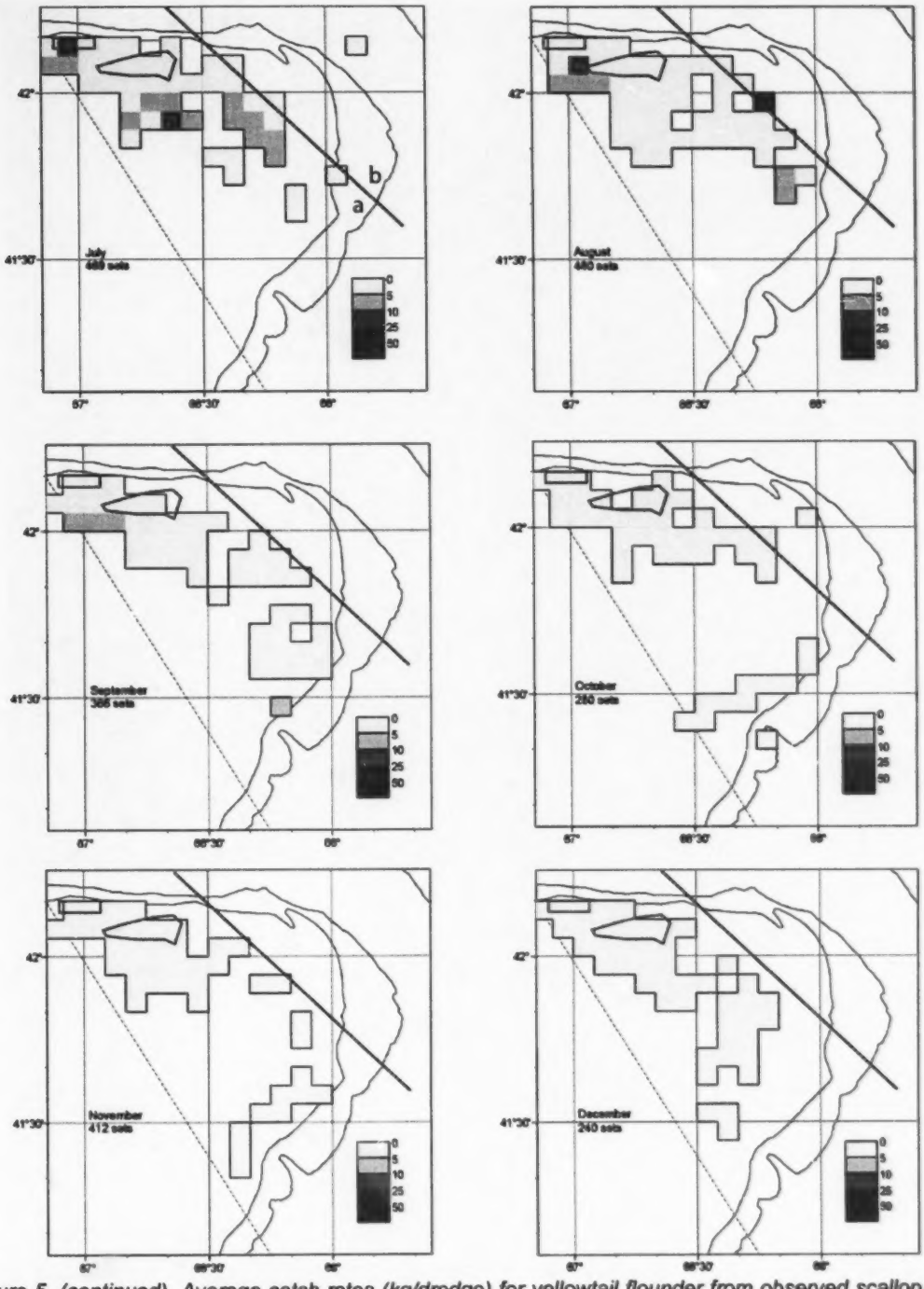

Figure 5. (continued). Average catch rates (kg/dredge) for yellowtail flounder from observed scallop trips in 2001 to 2009 (except 2003) on Georges Bank. The areas outlined in red are the voluntary scallop seed closure areas that are currently in place.

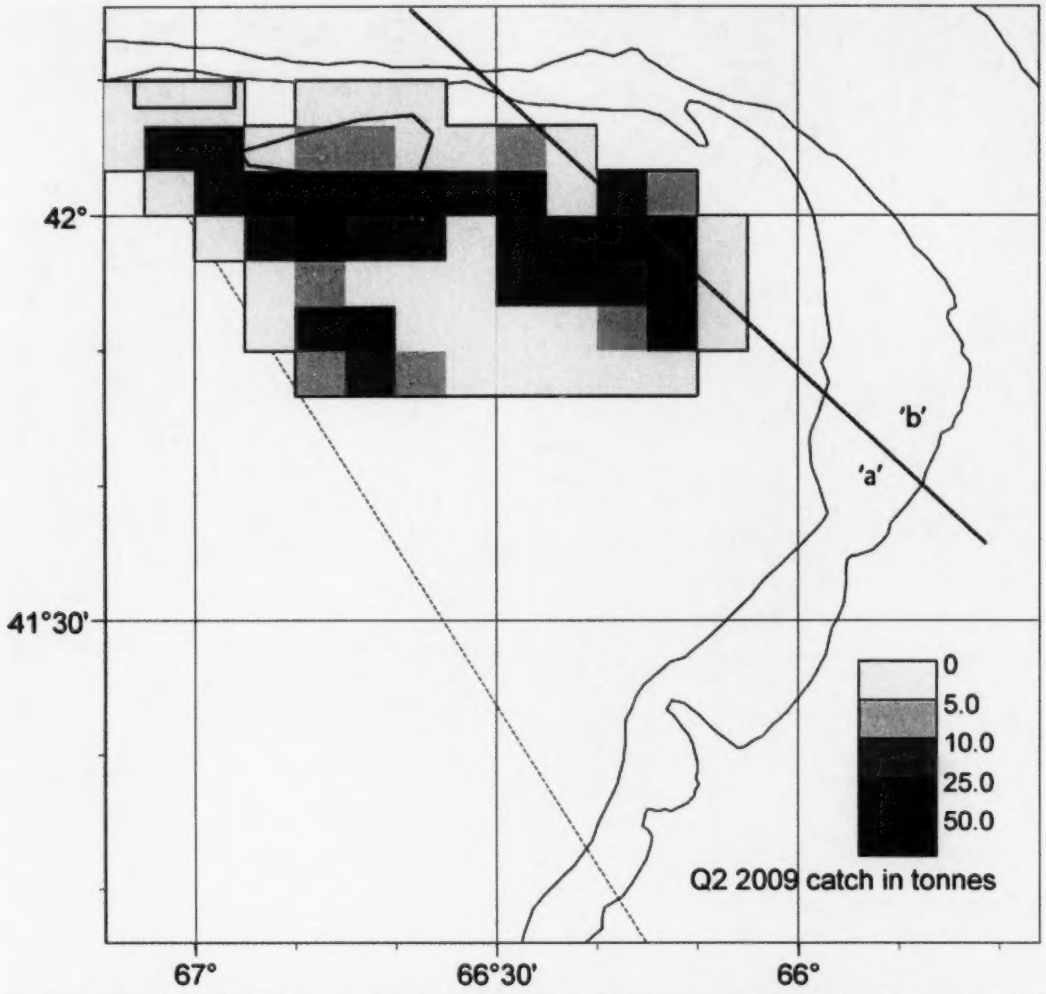

Figure 6. Distribution of offshore scallop catches (tonnes of meats) during the second quarter of 2009. The areas outlined in red are the voluntary scallop seed closure areas that are currently in place.

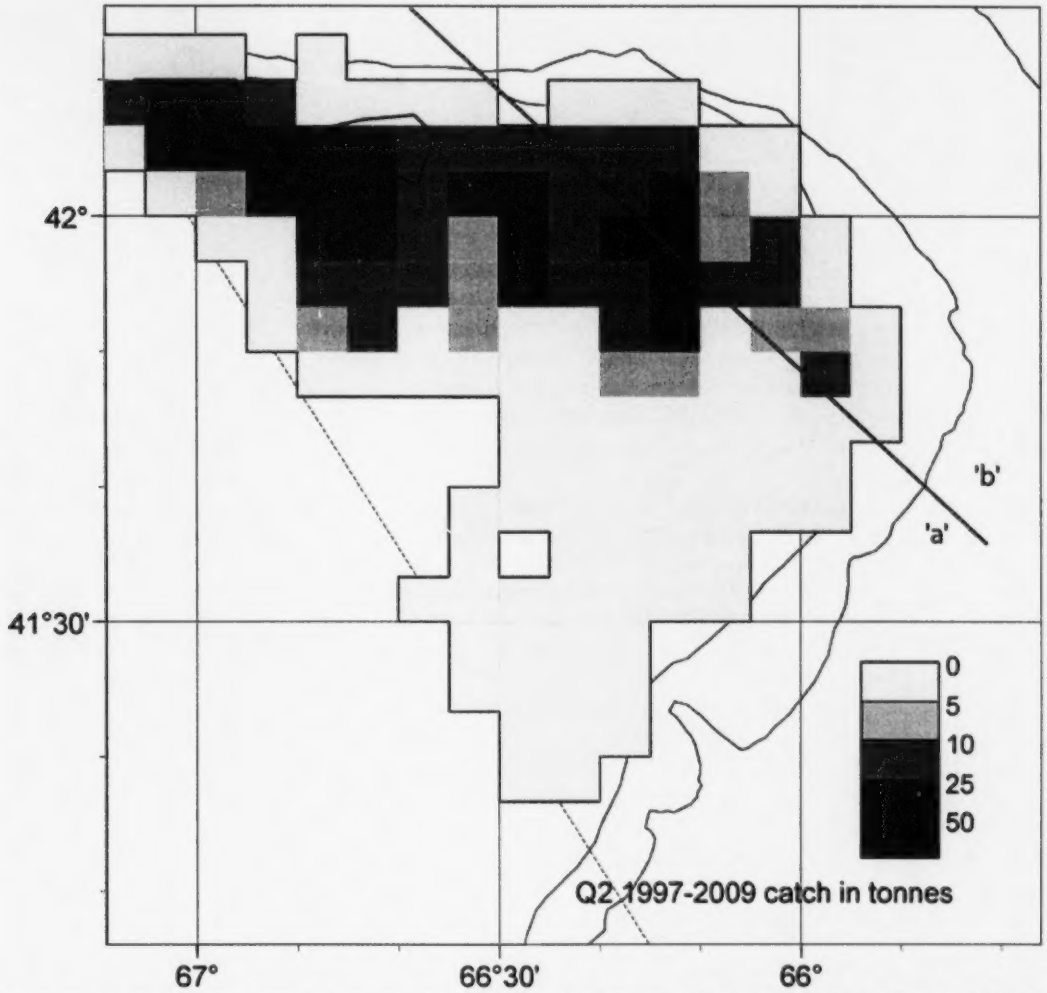

Figure 7. Average scallop catch (tonnes of meats) per cell per year during the period 1997 to 2009. The areas outlined in red are the voluntary scallop seed closure areas that are currently in place.

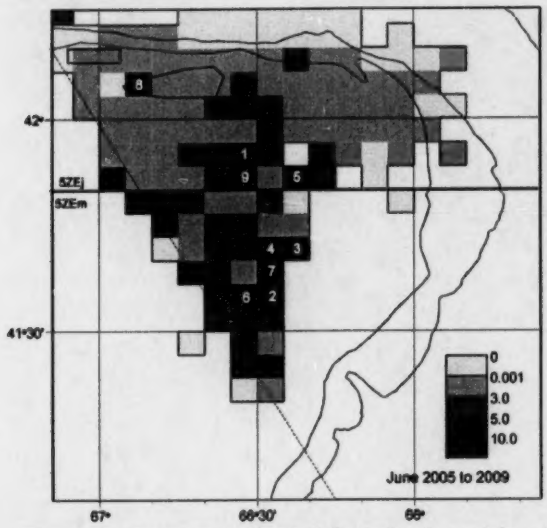

Figure 8. Average yellowtail flounder by-catch rates (kg/hour) for the months of June during 2005 to 2009 for observed otter trawl sets on Georges Bank. Cells located on the Canadian side with rates greater than 10 kg/hour are labeled in descending order.

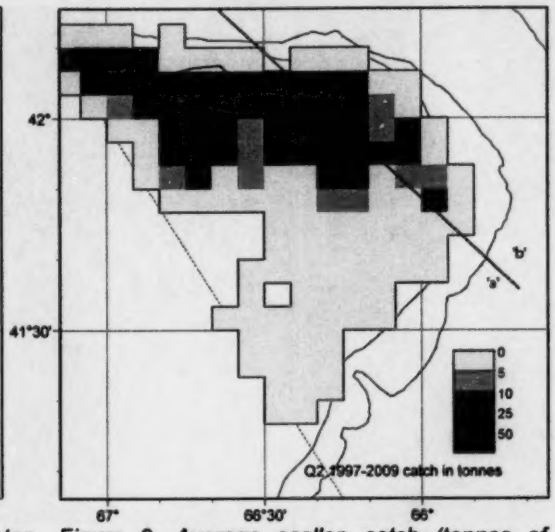

Figure 9. Average scallop catch (tonnes of meats) per cell per year during the period 1997 to 2009. The areas outlined in red are the voluntary scallop seed closure areas that are currently in place.

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Sources of Information

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